

IN THE MATTER OF
KOREAN PATENT APPLICATION
UNDER SERIAL NO. 10-2002-0079300

I, THE UNDERSIGNED, HEREBY DECLARE :
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KOREAN PATENT APPLICATION UNDER

SERIAL NO.: 10-2002-0079300


FILED ON: December 12, 2002

IN THE NAME OF: LG ELECTRONICS INC.

FOR: STRUCTURE OF DISPLAY
APPARATUS

IN WITNESS WHEREOF, I SET MY HAND HERETO

THIS 7th DAY OF December, 2006

BY 

KIM, EUN-HEE

[Translation]

PATENT APPLICATION

To : Director General
The Patent Office

Date of Application : 2002. 12. 12

Classification for international patent : H04B 1/38

Title of the Invention : STRUCTURE OF DISPLAY APPARATUS

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Code No. : 1-2002-012840-3

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Request for Examination: Filed

This application is hereby filed pursuant to Article 42 of the Patent Law.

/S/ Attorney : YANG, Soon Suk

[Fee]

Basic filing fee -	14 Pages	29,000 WON
Additional filing fee -	Pages	0 WON
Fee for claiming a priority -	0 Case	0 WON
Fee for filing request for examination -	2 Claims	173,000 WON
Total -		202,000 WON

[Attached document]

1. Abstract, Specification (Drawing) -1 copy

[Abstract]

[Translation]

A structure of a display apparatus in a mobile communication terminal including a lower housing having a main LCD, and an upper housing coupled to the lower housing, the structure comprising: a lower housing coupling protrusion upwardly disposed at right and left edges of the lower housing; a supporting piece disposed at the lower housing so as to form a receiving space for receiving an LCD module in the lower housing coupling protrusion; an upper housing coupling rib downwardly disposed at right and left edges of the upper housing so that an outer side thereof can come in contact with an inner side of the lower housing coupling protrusion; an upper housing contact end connected to an outer side of the upper housing coupling rib thus to be contact-supported by an upper end of the lower housing coupling protrusion; and an impact distribution rib downwardly disposed in the upper housing coupling rib so as to be towards the supporting piece when the upper housing coupling rib, the upper housing contact end, and the lower housing coupling protrusion are connected to one another.

The structure further comprises an impact distribution rib in the upper housing coupling rib. Accordingly, when an impact having a force more than a certain size is applied to an upper casing, the impact is distributed to the supporting piece by the impact distribution rib, thereby decreasing a deformation degree of a lower casing. Accordingly, an impact due to contact between the upper casing and an LCD module is prevented from being occurred.

[Representative view]

FIG. 5

[Index]

Impact, Display apparatus, LCD module, LC screen, rib

[SPECIFICATION]

[Title of the Invention]

Structure of display apparatus

[Brief description of the Drawings]

FIG. 1 is a perspective view showing a mobile communication terminal in accordance with the related art;

FIG. 2 is an explosive perspective view of a display apparatus of the mobile communication terminal in accordance with the related art;

FIG. 3 is a sectional view of the display apparatus of the mobile communication terminal in accordance with the related art;

FIG. 4 is an explosive perspective view of a mobile communication terminal according to the present invention; and

FIG. 5 is a sectional view of the mobile communication terminal according to the present invention.

**** Explanation for the major reference numerals ****

122: lower housing	122-1: receiving space
122-2: supporting piece	122-3: lower housing coupling protrusion
124: mounting member	124-2: mounting space
124-2: outer piece	
126: LCD module	
128: upper housing	

[Detailed description of the invention]

[Object of the invention]

[Field of the invention and background art]

The present invention relates to a mobile communication terminal, and more particularly, to a structure of a display apparatus capable of protecting an LCD with a slim structure of displaying a dialed phone number or a current function and state.

A mobile communication terminal serves to communicate with another party while a user moves anywhere and anytime. Nowadays, the number of the mobile communication terminals is being drastically increased.

As shown in FIG. 1, the mobile communication terminal 10 comprises a body 11 having each kind of component therein and having an antenna at one upper end, a plurality of keypads 12 formed at a front surface of the body 11 and pressed by a user for ON/OFF of a call, a display apparatus 20 hinge coupled to two upper sides of the mobile communication terminal for opening the keypad 12 by a user's opening/closing, and displaying a phone number input and an operation state accordingly as the keypad 12 is pressed; a transceiver 13 respectively provided at an upper side of the display apparatus 20 and a lower side of the keypad 12; and a battery pack 14 for supplying power into the body having the transceiver 13.

As shown in FIG. 2, the display apparatus 20 comprises a lower housing 22 having a main LCD 29, an upper housing 28 coupled to the lower housing 22, etc.

Referring to FIG. 2, a lower housing coupling protrusion 22-3 is upwardly installed at right and left edges of the lower housing 22. Also, a supporting piece 22-2 is disposed at the lower housing 22 so as to form a receiving space 22-1 for receiving an LCD module 26 in the lower housing coupling protrusion 22-3.

An outer piece 24-2 is protruding from a bottom so as to form a mounting space

24-1, and a mounting member 24 mounted in the receiving space 22-1 is provided.

An LCD module 26 is mounted in the mounting member 24, and the upper housing 28 is coupled to an upper portion of the lower housing 22 where the LCD module 26, etc. are received. Referring to FIG. 3, an upper housing coupling rib 28-3 is formed at the upper housing 28 so that an outer side thereof can come in contact with inside of the lower housing coupling protrusion 22-3. Also, an upper housing contact end 28-4 connected to an outer side of the upper housing coupling rib 28-3 thus to be contact-supported by an upper end of the lower housing coupling protrusion 22-3 is formed at the upper housing 28.

An assembly process of the display apparatus 20 will be explained. First, the mounting member 24 is received in the receiving space 22-1 of the lower housing 22, and then the LCD module 26 is mounted in the mounting space 24-1 of the mounting member 24. Then, the upper housing 28 is coupled to an upper portion of the lower housing 22.

In the conventional display apparatus 20, only the upper housing coupling rib 28-3 and the upper housing contact end 28-4 of the upper housing 28 come in contact with the lower housing 22. Accordingly, when an impact is applied to the upper housing 28, it is concentrated on the lower housing coupling protrusion 22-3 positioned at right and left edges of the lower housing 22. Accordingly, the lower housing 28 has a great downward deformation degree thus to directly come in contact with the LCD module 26, thereby applying the impact to the LCD module 26.

[Construction of the present invention]

To achieve the above object, there is provided a structure of a display apparatus capable of decreasing a downward deformation degree of a lower casing due to an impact

by distributing an impact more than a certain force applied to an upper casing towards a supporting piece through an impact distribution rib by further providing the impact distribution rib in an upper housing coupling rib, and thereby capable of decreasing an impact occurrence probability due to a contact between the upper casing and an LCD module.

In a mobile communication terminal including a lower housing having a main LCD and an upper housing coupled to the lower housing, the structure of a display apparatus comprises a lower housing coupling protrusion upwardly disposed at right and left edges of the lower housing; a supporting piece disposed at the lower housing so as to form a receiving space for receiving an LCD module in the lower housing coupling protrusion; an upper housing coupling rib downwardly disposed at right and left edges of the upper housing so that an outer side thereof can come in contact with an inner side of the lower housing coupling protrusion; an upper housing contact end connected to an outer side of the upper housing coupling rib thus to be contact-supported by an upper end of the lower housing coupling protrusion; and an impact distribution rib downwardly disposed in the upper housing coupling rib so as to be towards the supporting piece when the upper housing coupling rib, the upper housing contact end, and the lower housing coupling protrusion are connected to one another.

In the structure of a display apparatus, the impact distribution rib is formed to come in contact with the supporting piece when an impact more than a certain force is applied to the upper housing, and is formed to have a certain gap from the supporting piece so as not to come in contact with the supporting piece when an impact less than a certain force is applied to the upper housing.

FIG. 4 is an explosive perspective view of a mobile communication terminal according to the present invention, and FIG. 5 is a sectional view of the mobile

communication terminal according to the present invention.

As shown in FIG. 1, the mobile communication terminal 10 comprises a body 11 having each kind of component therein and having an antenna at one upper end, a plurality of keypads 12 formed at a front surface of the body 11 and pressed by a user for ON/OFF of a call, a display apparatus 20 hinge coupled to two upper sides of the mobile communication terminal for opening the keypad 12 by a user's opening/closing, and displaying a phone number input and an operation state accordingly as the keypad 12 is pressed; a transceiver 13 respectively provided at an upper side of the display apparatus 20 and a lower side of the keypad 12; and a battery pack 14 for supplying power into the body having the transceiver 13.

Referring to FIG. 4, the structure of a display apparatus for a mobile communication terminal comprises a lower housing 122, a mounting member 124, an upper housing 128, etc.

A lower housing coupling protrusion 122-3 is upwardly disposed at right and left edges of the lower housing 122, and a supporting piece 122-2 is protruding from a bottom of the lower housing 122 so that a receiving space 122-1 for receiving an LCD module 126, etc. can be formed in the lower housing coupling protrusion 122-3.

A mounting member 124 having an outer piece 124-2 is protruding from a bottom so as to form a mounting space 124-1. The mounting member 124 is mounted in the receiving space 122-1.

An LCD module 126 is mounted in the mounting member 124, and the upper housing 128 is coupled to an upper portion of the lower housing 122 where the LCD module 126, etc. are received.

Referring to FIG. 5, an upper housing coupling rib 128-3 is formed at the upper housing 128 so that an outer side thereof can come in contact with inside of the lower

housing coupling protrusion 122-3. Also, an upper housing contact end 128-4 connected to an outer side of the upper housing coupling rib 128-3 thus to be contact-supported by an upper end of the lower housing coupling protrusion 122-3 is formed at the upper housing 128.

An impact distribution rib 128-6 is formed at the upper housing 128 towards inside the upper housing coupling rib 128-3. The impact distribution rib 128-6 is downwardly disposed so as to be towards the supporting piece 122-2 when the upper housing coupling rib 128-3 and the housing contact end 128-4 are coupled to the lower housing coupling protrusion 122-3. The impact distribution rib 128-6 is formed so as to come in contact with the supporting piece 122-2 when an impact more than a certain force is applied to the upper housing 128, and is formed to have a certain gap from the supporting piece 122-2 so as not to come in contact with the supporting piece 122-2 when an impact less than a certain force is applied to the upper housing 128.

Hereinafter, an operation of the structure of a display apparatus will be explained.

Referring to FIGS. 4 and 5, when the upper housing 128 is a little deformed downwardly due to an impact less than a certain force, it is not directly influenced by the impact since it is on an upper end of the LCD module 126.

When the upper housing 128 is a little deformed downwardly due to an impact more than a certain force, the impact distribution rib 128-6 contacts the supporting piece 122-2 thus to distribute an impact to the supporting piece 122-2 by the impact distribution rib 128-6. Accordingly, a downward deformation amount of the lower casing 122 is decreased, thereby decreasing an occurrence probability of an impact due to a contact between the upper casing 128 and the LCD module 126.

In the aforementioned embodiment, the impact distribution rib was formed to have a certain gap from the supporting piece. However, it is also possible to construct

that the impact distribution rib comes in contact with the supporting piece.

In the aforementioned embodiment, the impact distribution rib has the mounting member. However, the impact distribution rib may not be provided with the mounting member.

[Effect of the invention]

As aforementioned, in the structure of a display apparatus, the impact distribution rib was additionally installed in the upper housing coupling rib. Accordingly, when an impact more than a certain force is applied to the upper casing, the impact is distributed to the supporting piece by the impact distribution rib. Accordingly, a downward deformation amount of the lower casing is decreased, thereby decreasing an occurrence probability of an impact due to a contact between the upper casing and the LCD module.

In the present invention, a certain gap is formed between the upper housing coupling rib and the supporting piece, thereby facilitating a coupling between components.

What is claimed is:

1. A structure of a display apparatus in a mobile communication terminal including a lower housing having a main LCD, and an upper housing coupled to the lower housing, the structure comprising:

a lower housing coupling protrusion upwardly disposed at right and left edges of the lower housing;

a supporting piece disposed at the lower housing so as to form a receiving space for receiving an LCD module in the lower housing coupling protrusion;

an upper housing coupling rib downwardly disposed at right and left edges of the upper housing so that an outer side thereof can come in contact with an inner side of the lower housing coupling protrusion;

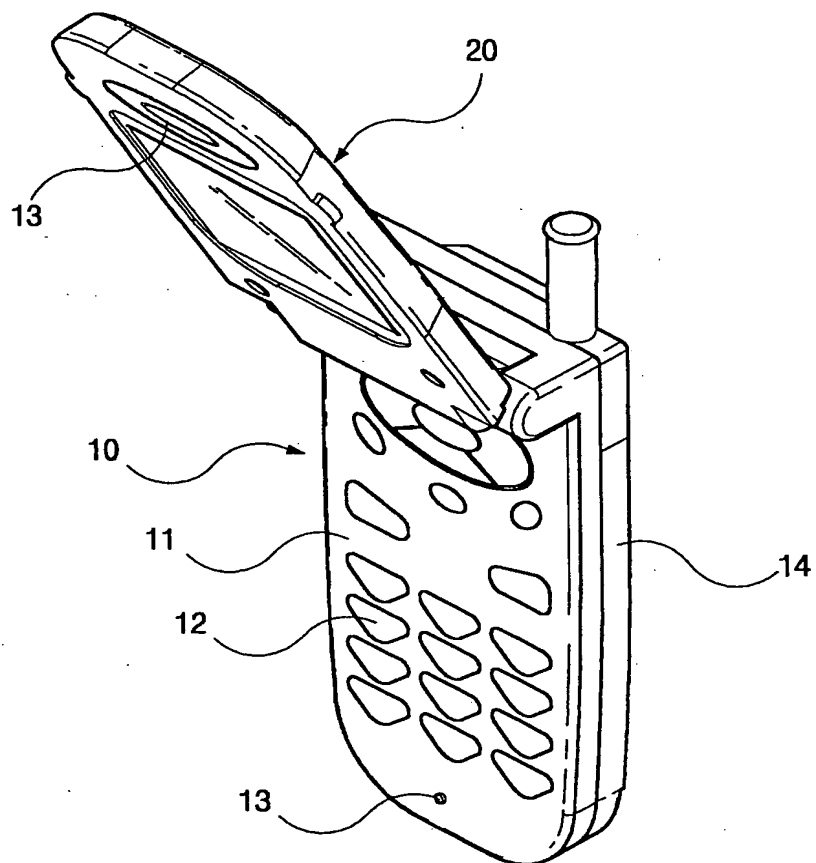
an upper housing contact end connected to an outer side of the upper housing coupling rib thus to be contact-supported by an upper end of the lower housing coupling protrusion; and

an impact distribution rib downwardly disposed in the upper housing coupling rib so as to be towards the supporting piece when the upper housing coupling rib, the upper housing contact end, and the lower housing coupling protrusion are connected to one another.

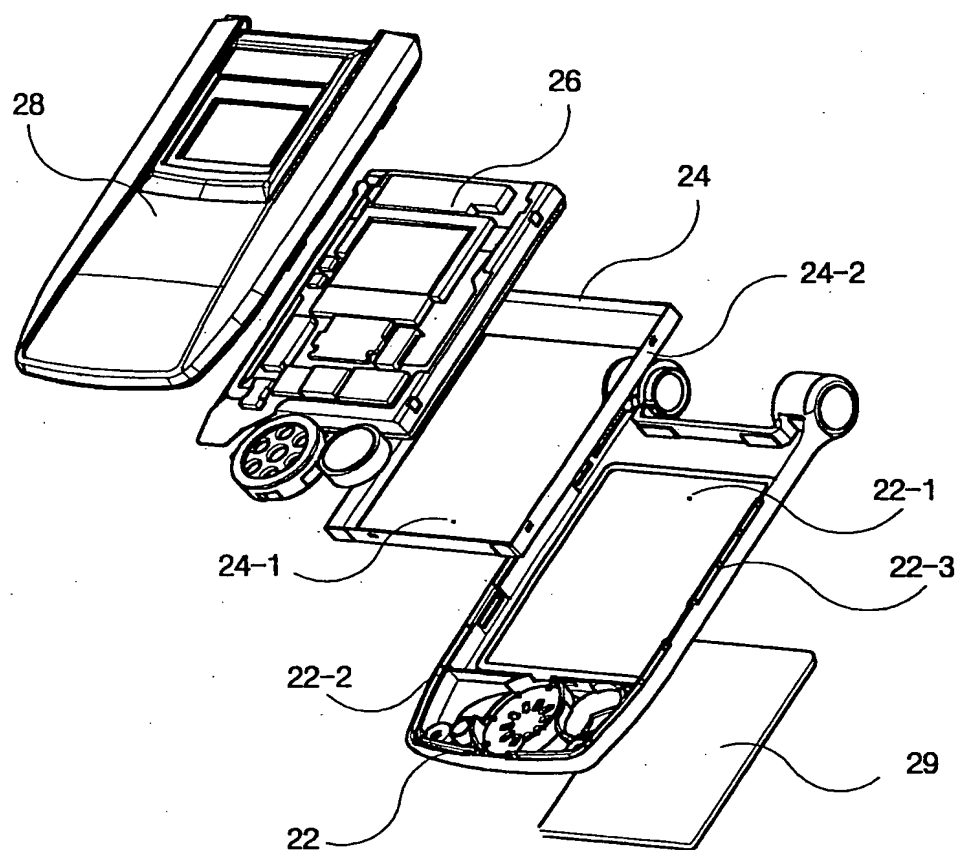
2. The structure of claim 1, wherein the impact distribution rib is formed to come in contact with the supporting piece when an impact more than a certain force is applied to the upper housing, and is formed to have a certain gap from the supporting piece so as not to come in contact with the supporting piece when an impact less than a certain force is applied to the upper housing.

[DRAWING]

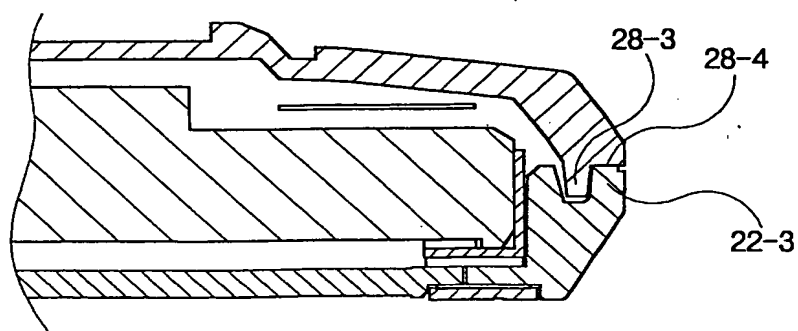
[FIG.1]



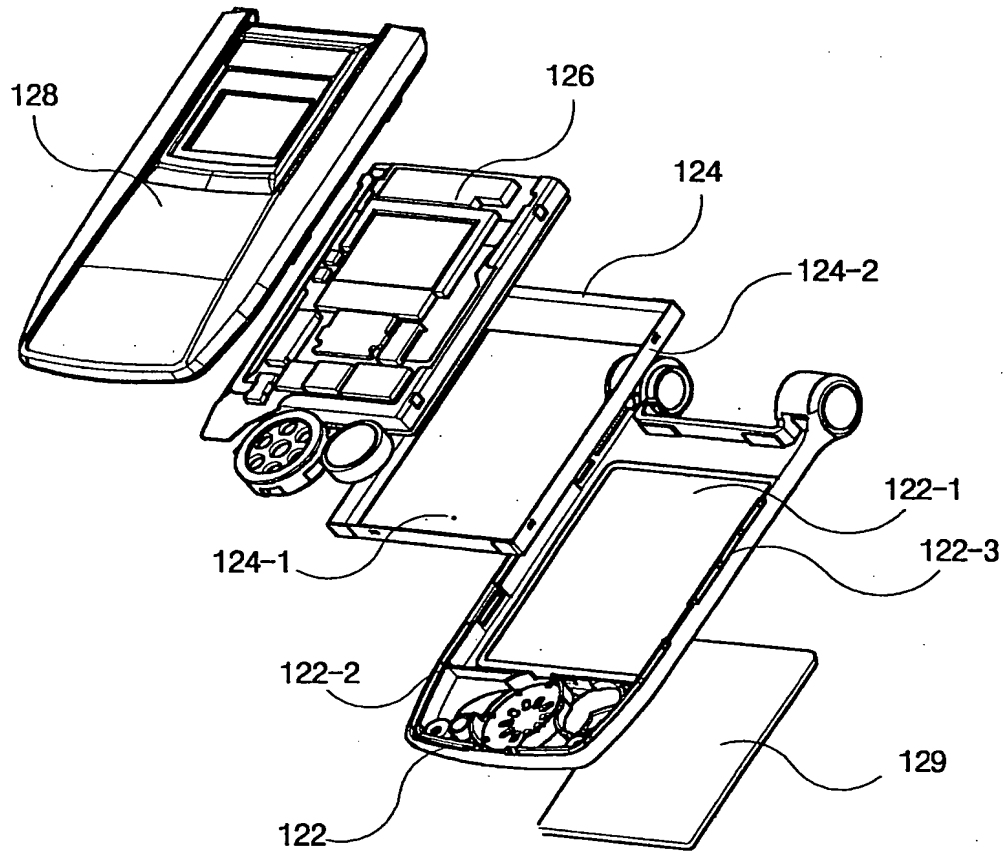
[FIG. 2]



[FIG. 3]



[FIG. 4]



[FIG.5]

